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FIG. 1A

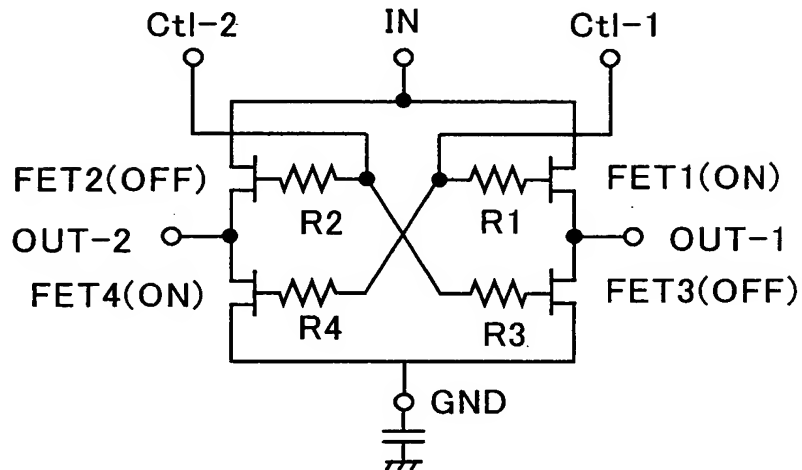


FIG. 1B

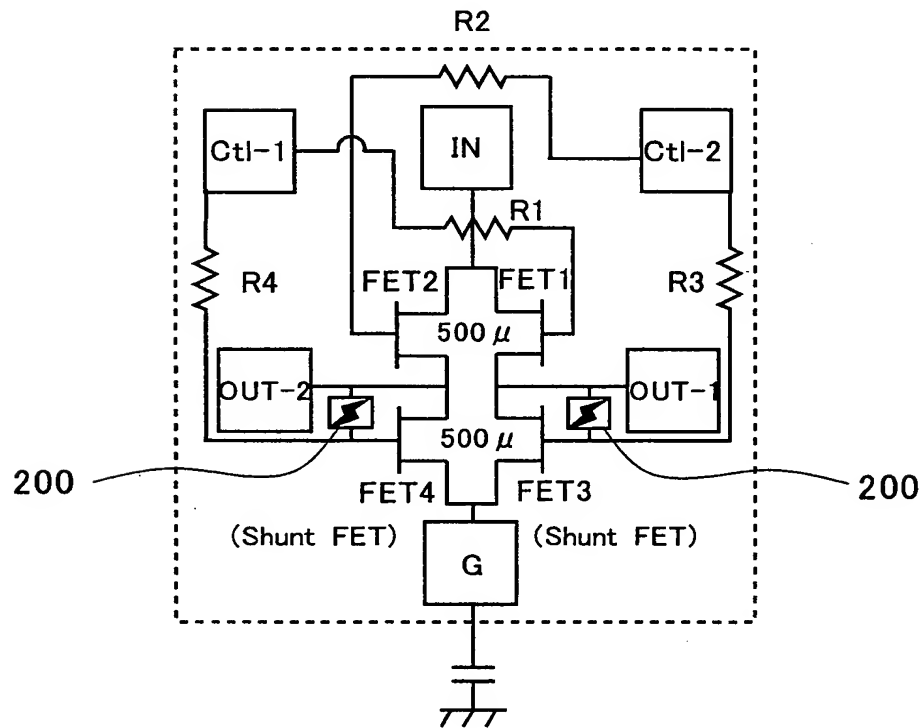


FIG.2

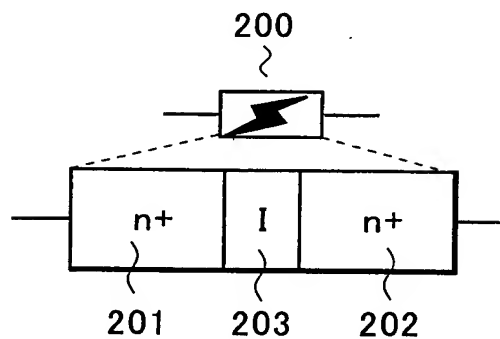


FIG.3A

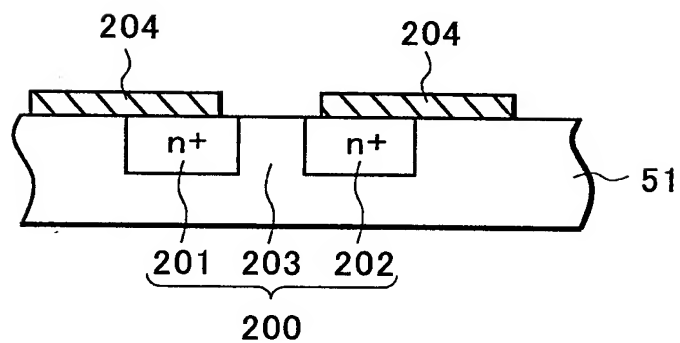
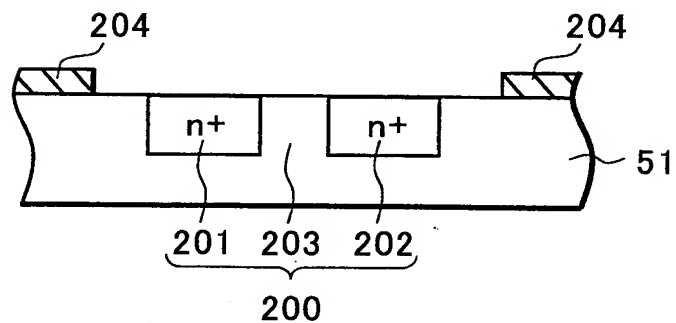
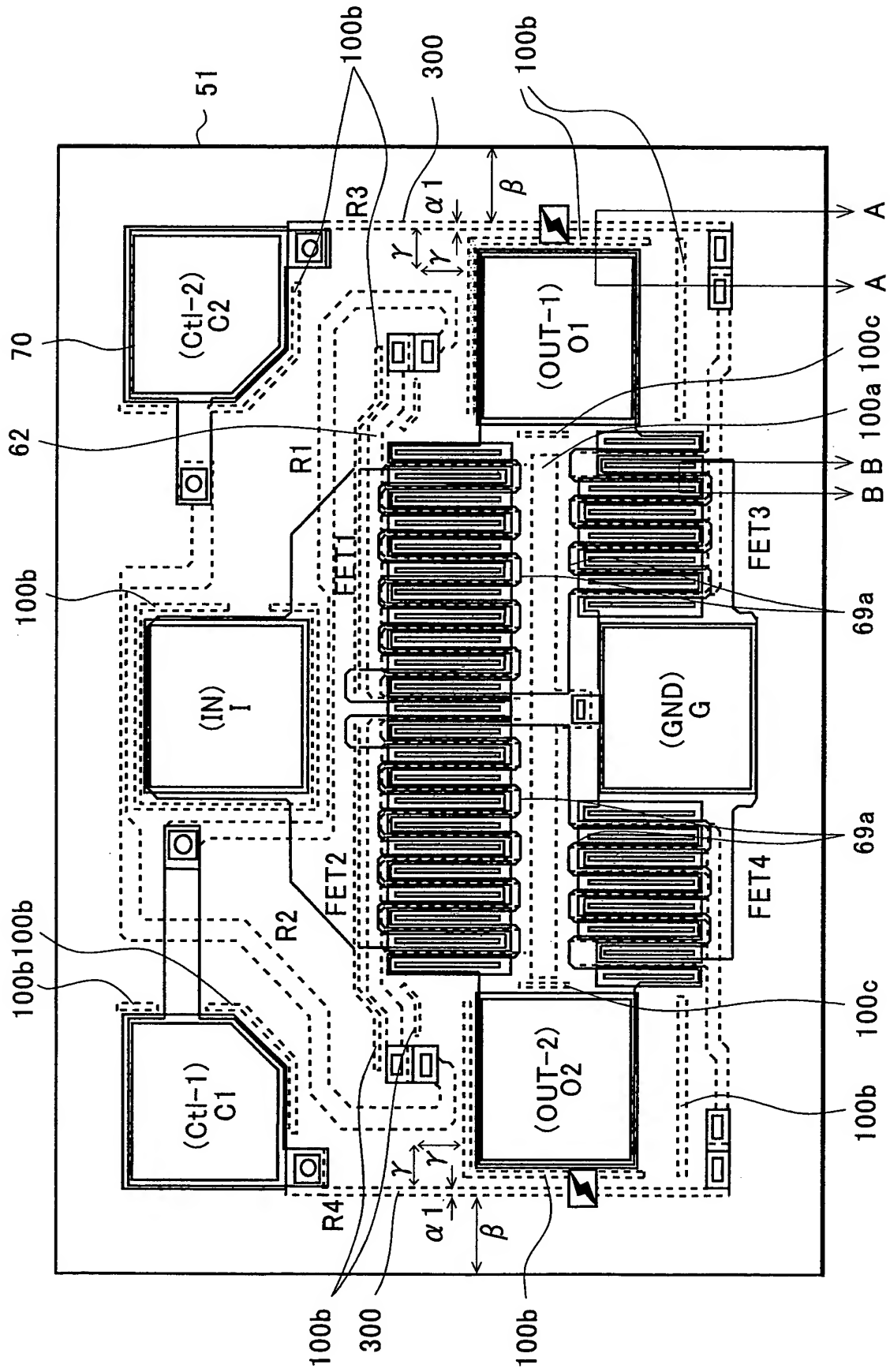


FIG.3B



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FIG.4



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FIG.5

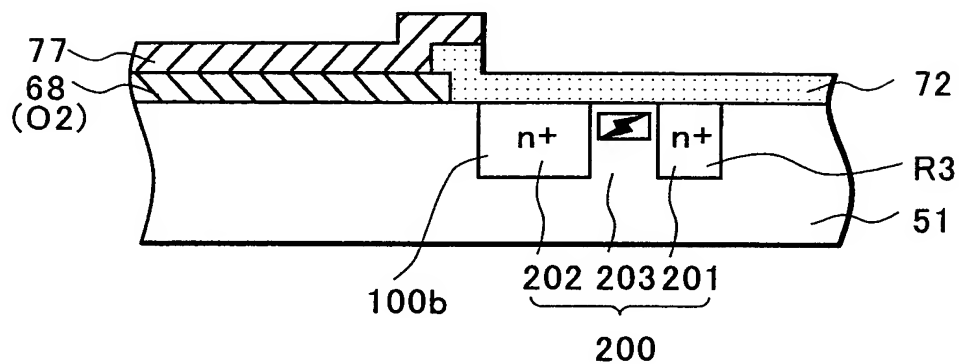


FIG.6A

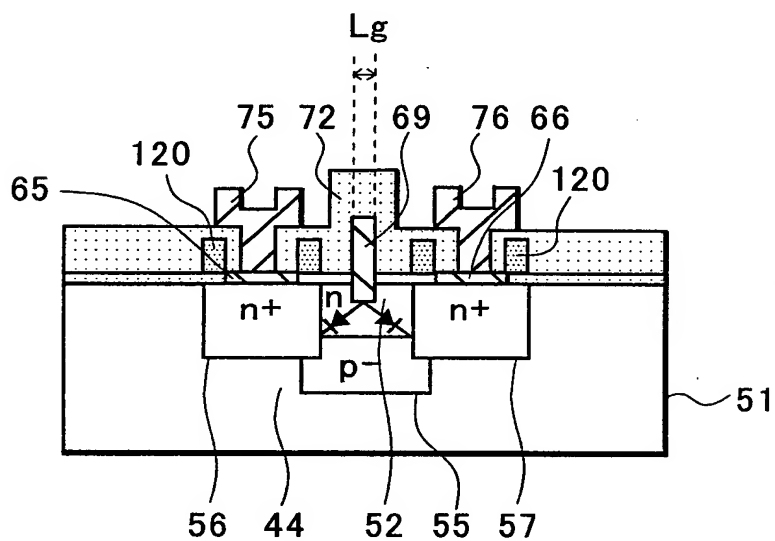


FIG.6B

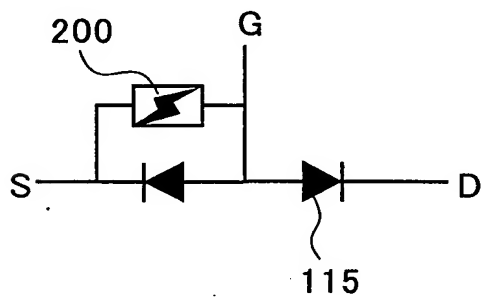
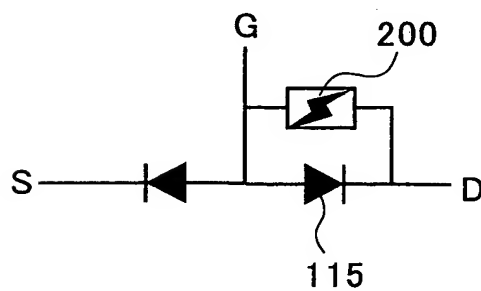


FIG.6C



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FIG. 7

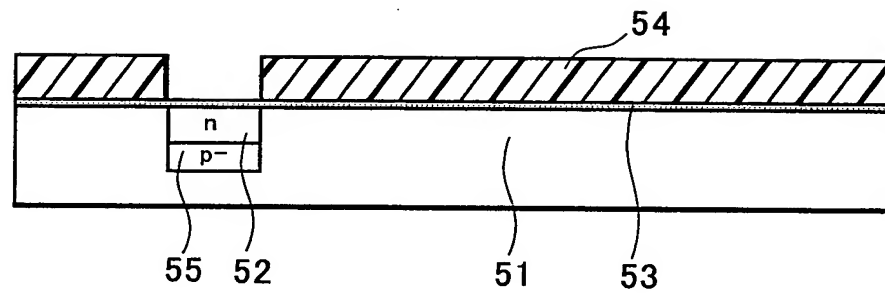


FIG. 8

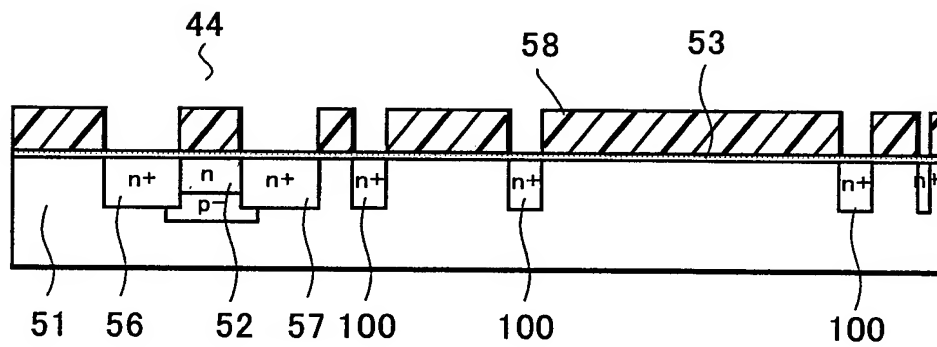


FIG.9A

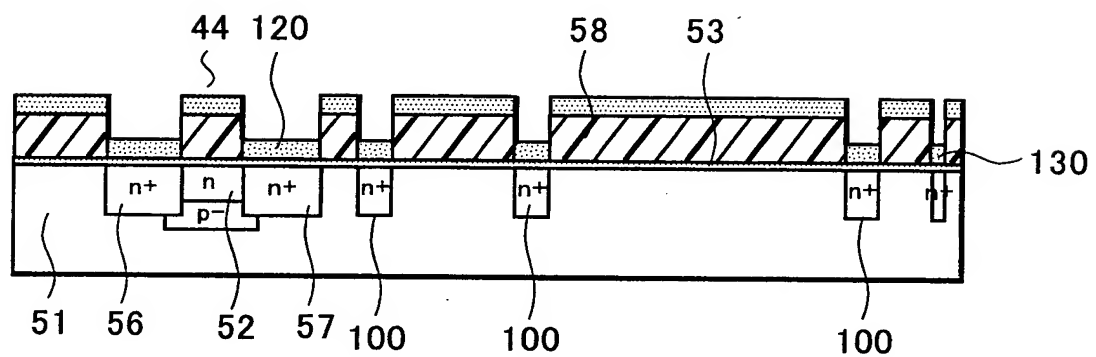
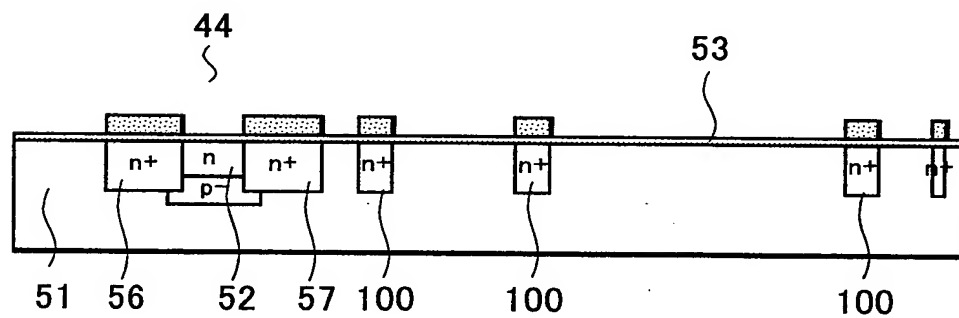


FIG.9B



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FIG.10A

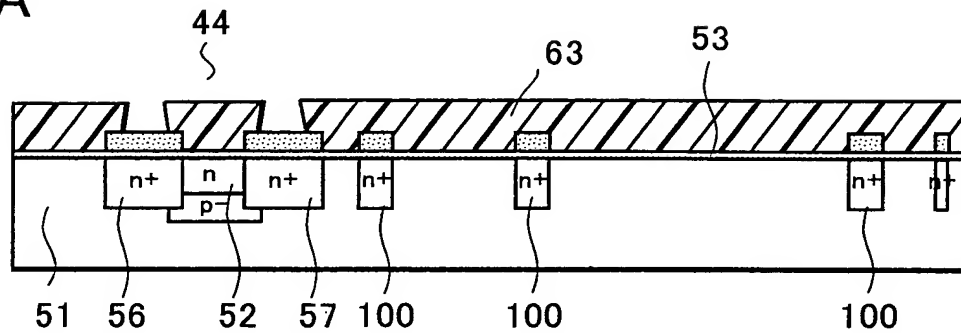


FIG.10B

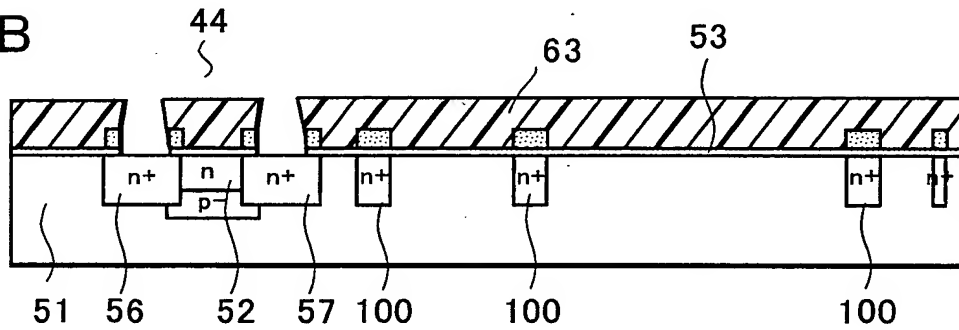


FIG.10C

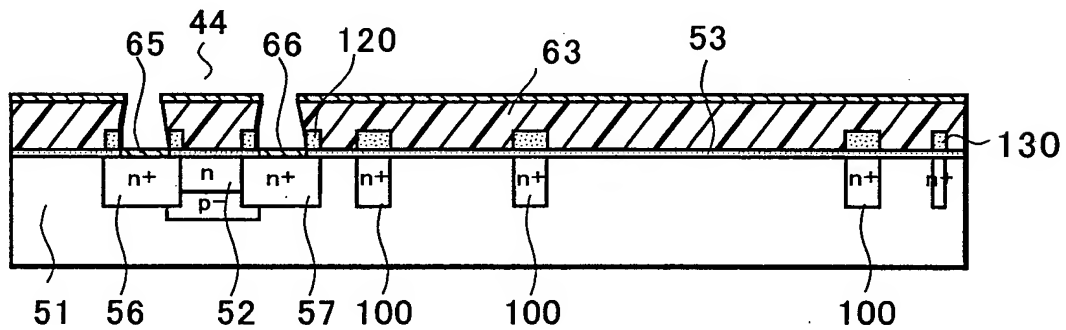


FIG.10D

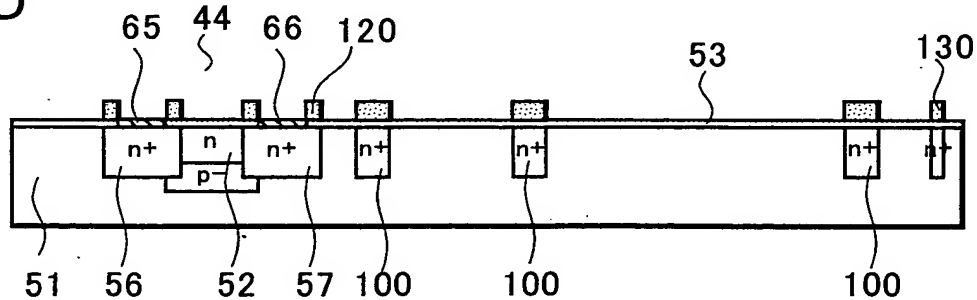


FIG.11A

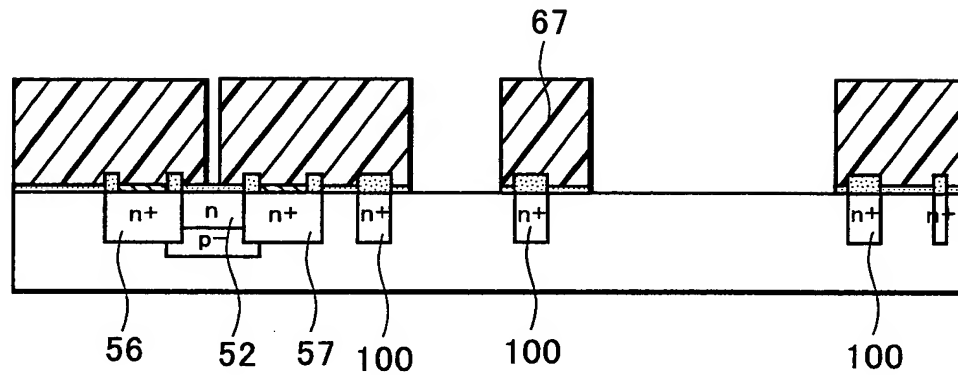


FIG.11B

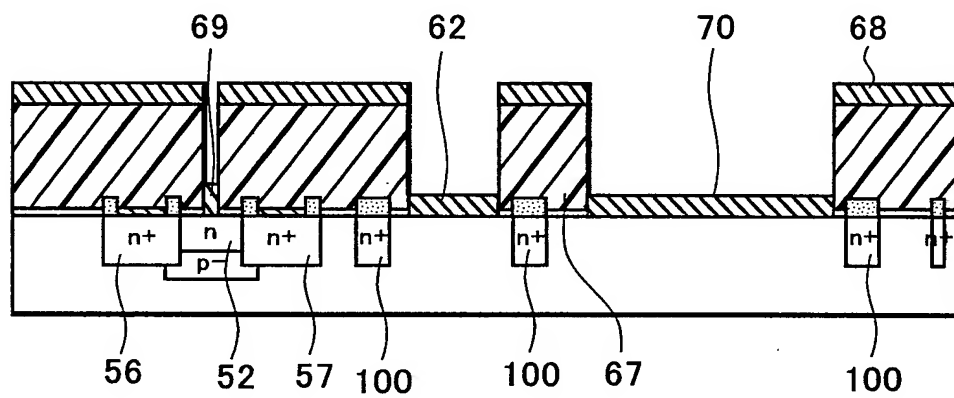
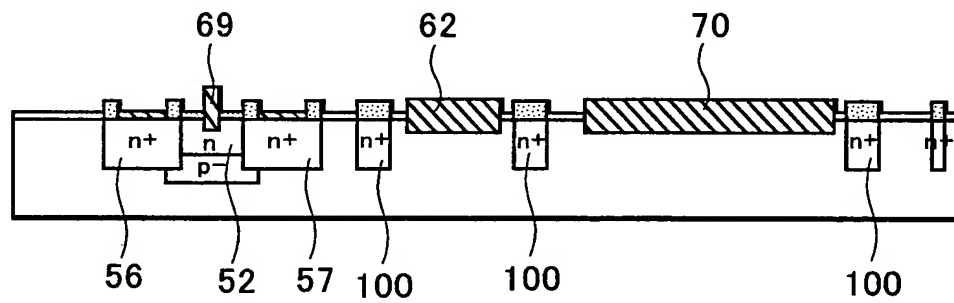


FIG.11C



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FIG.12A

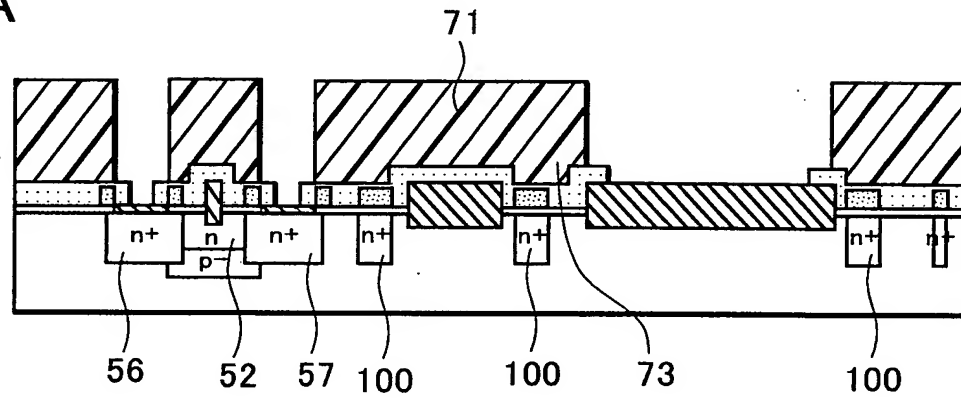


FIG.12B

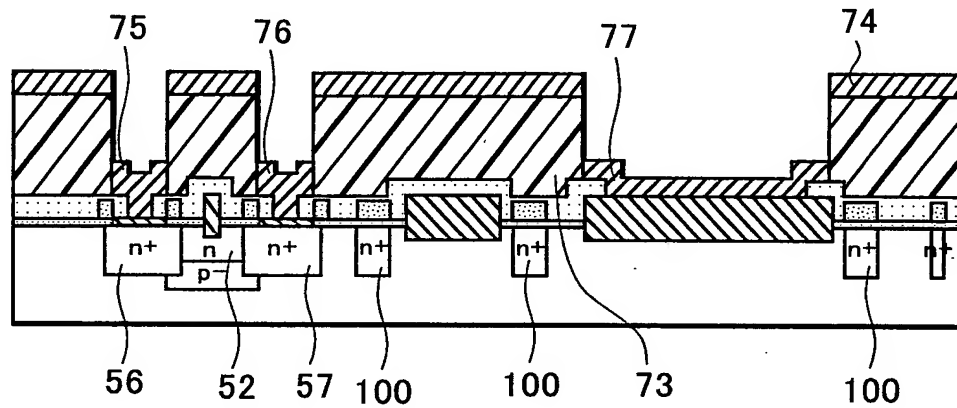
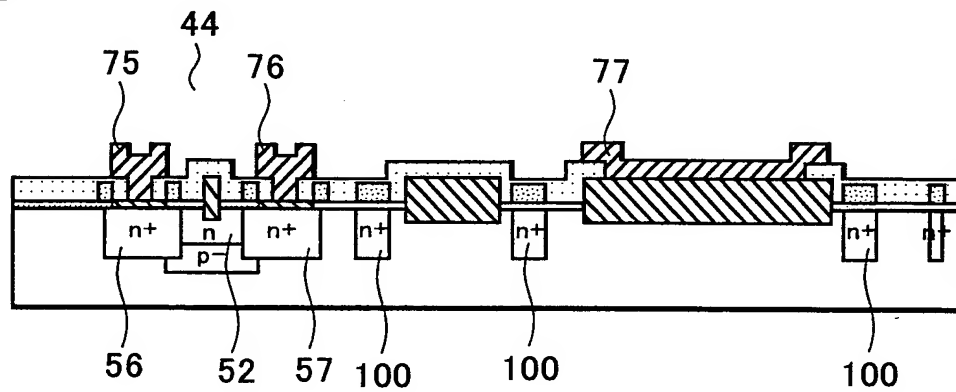
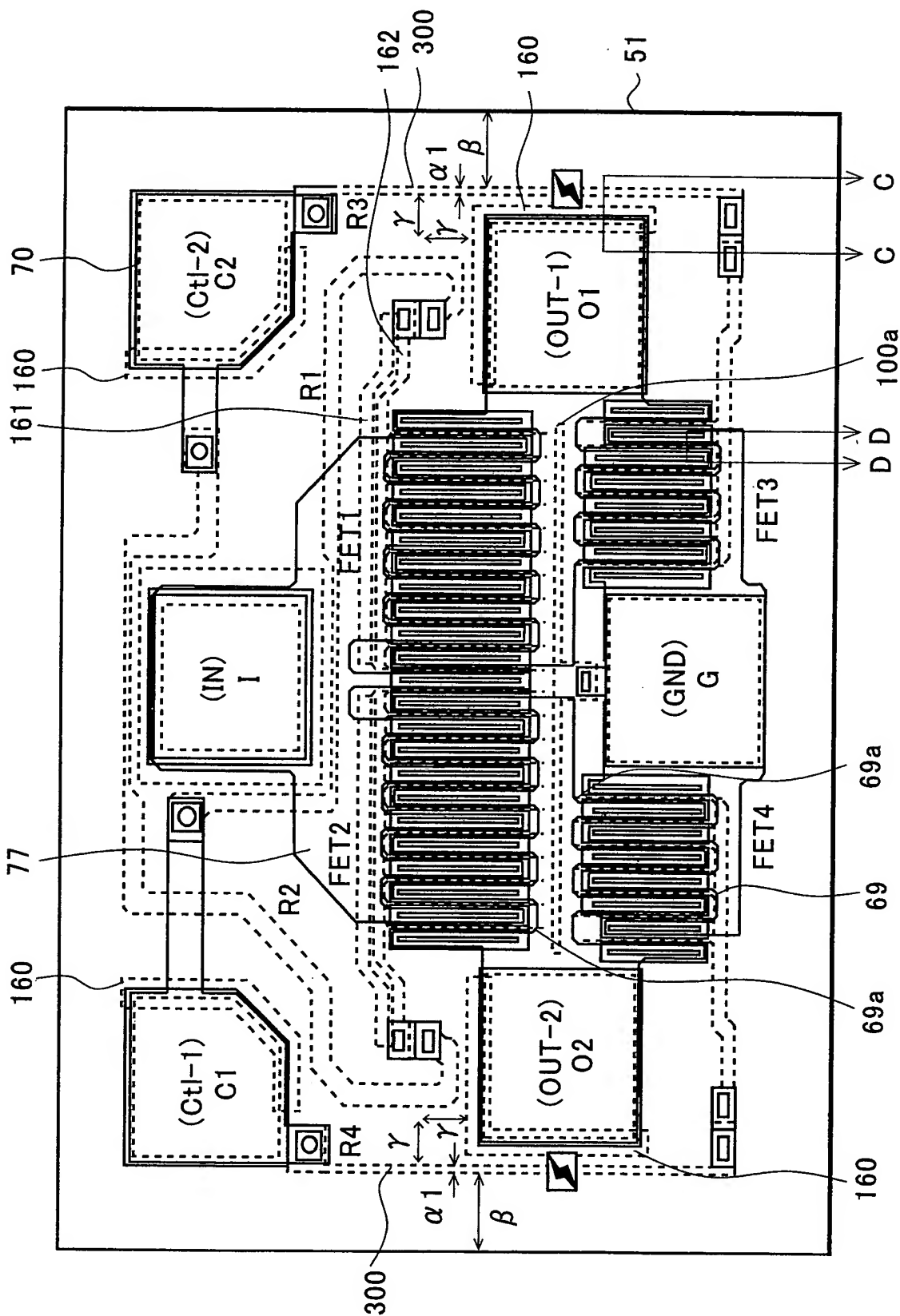


FIG.12C



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FIG.13



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FIG.14A

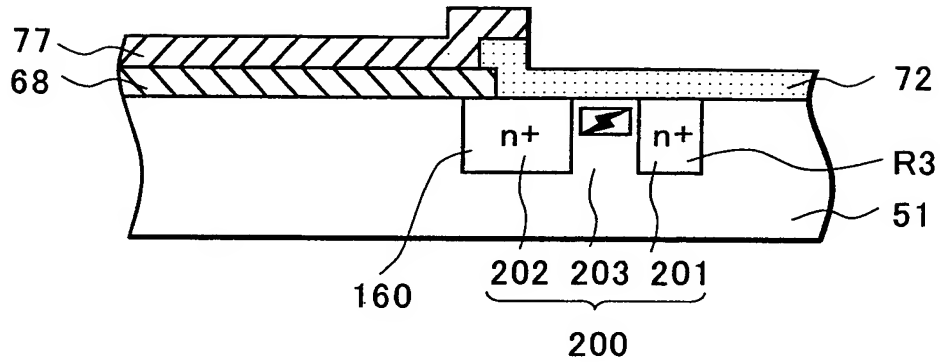


FIG.14B

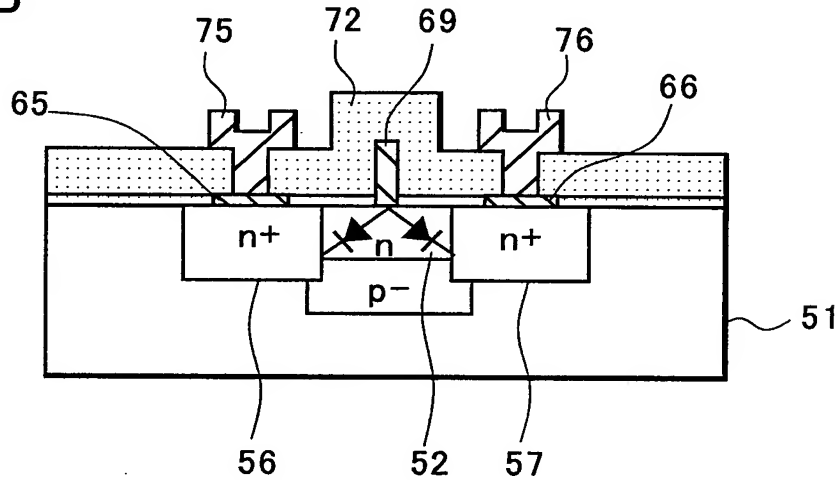


FIG.14C

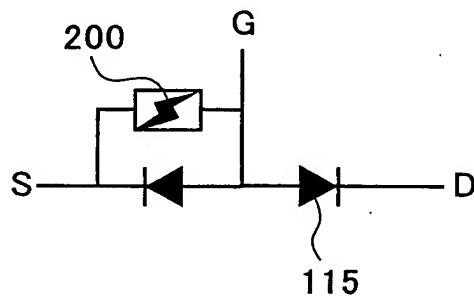
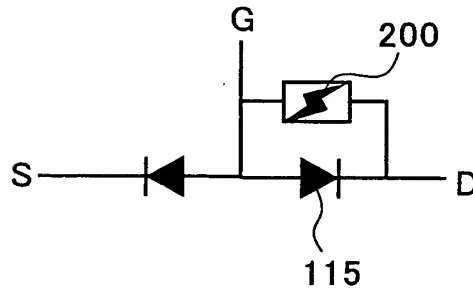


FIG.14D



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FIG.15

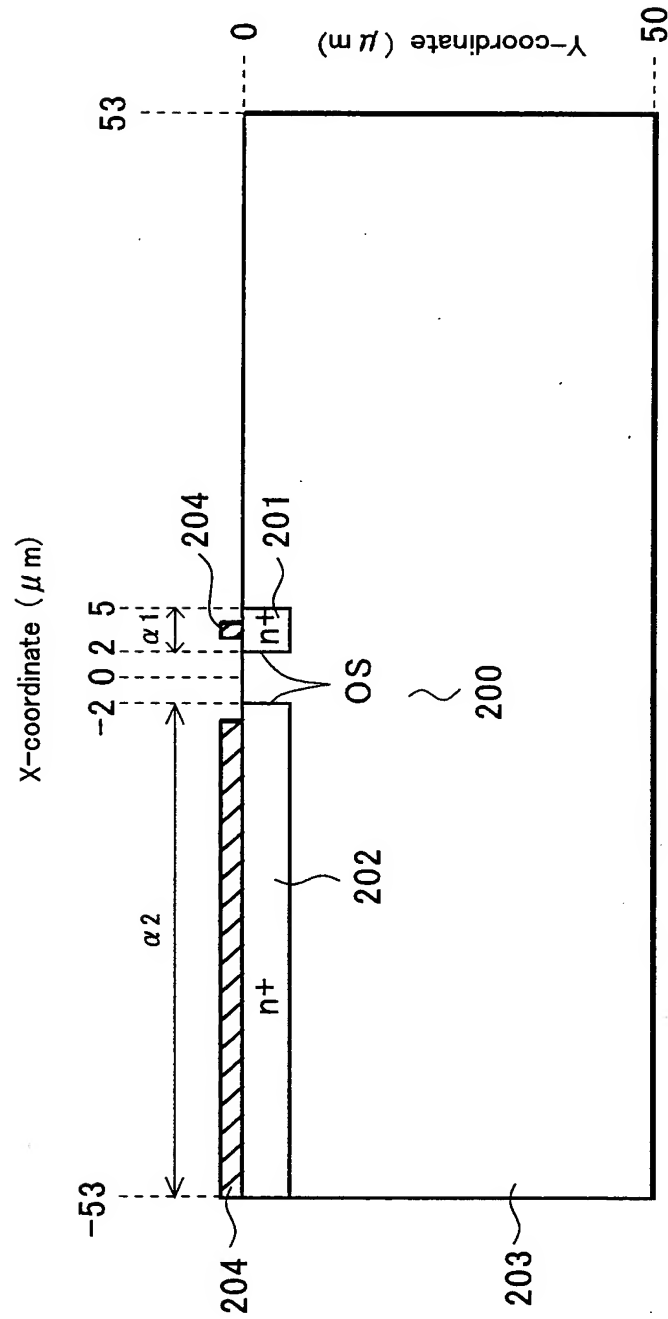


FIG. 16

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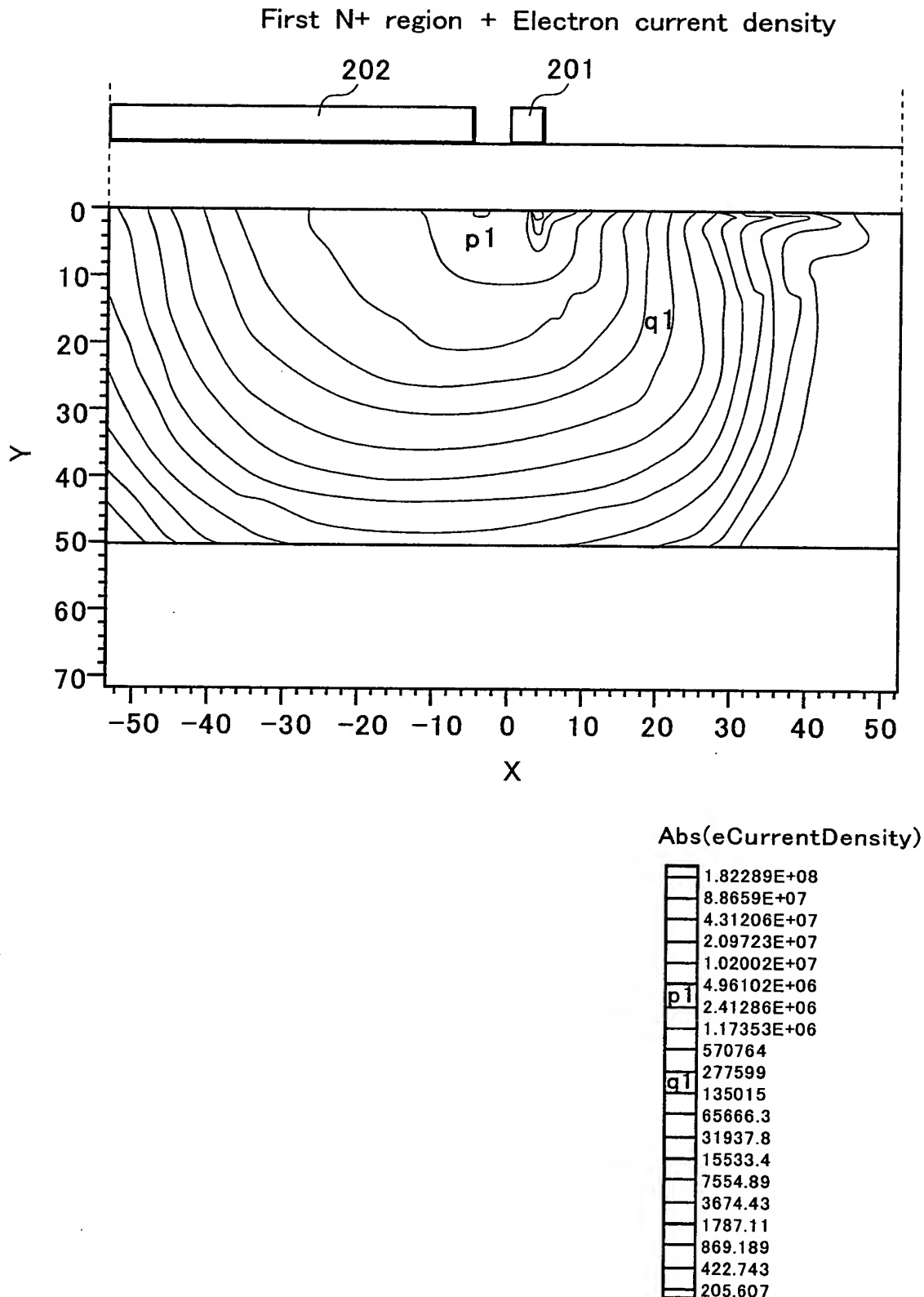


FIG.17

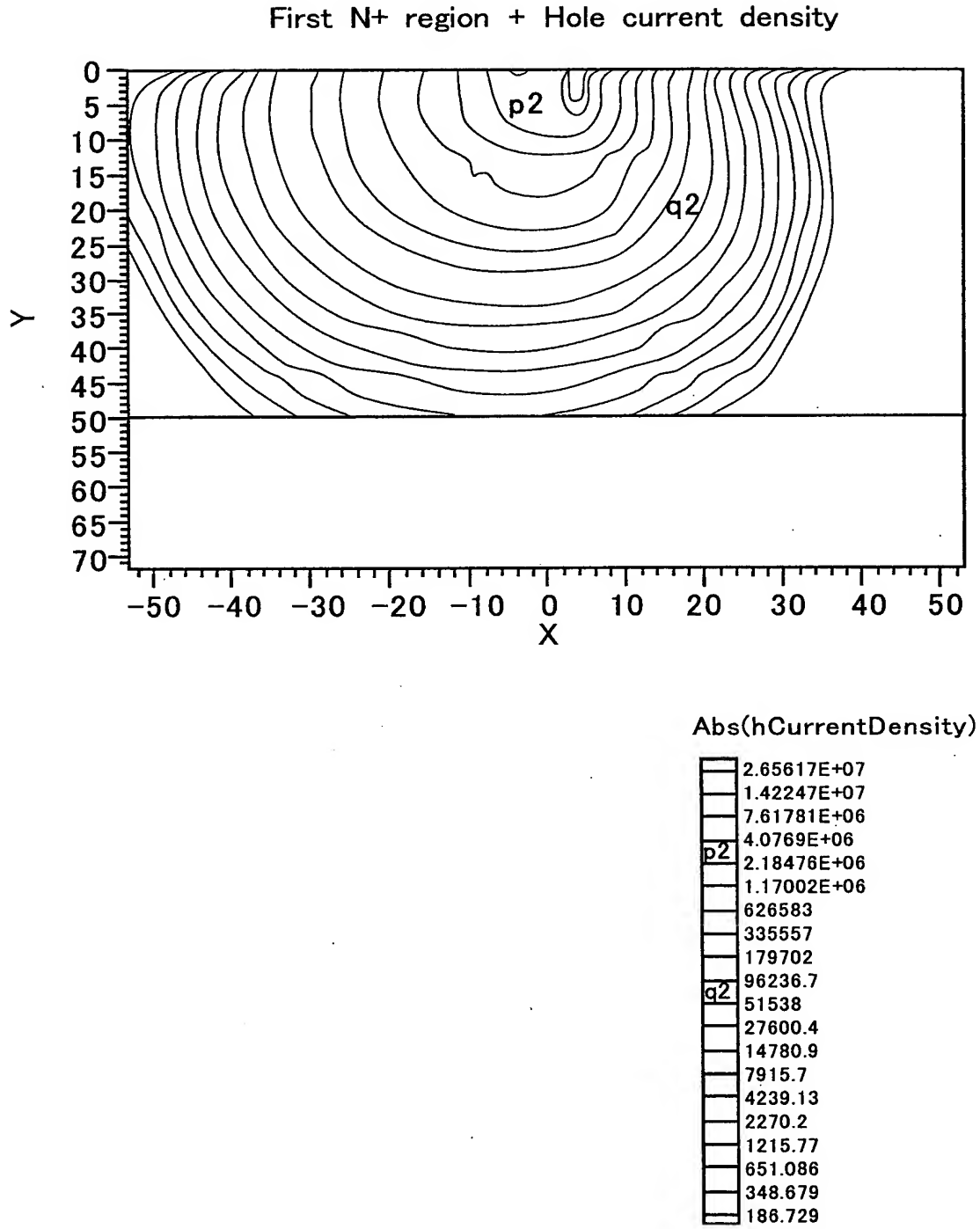
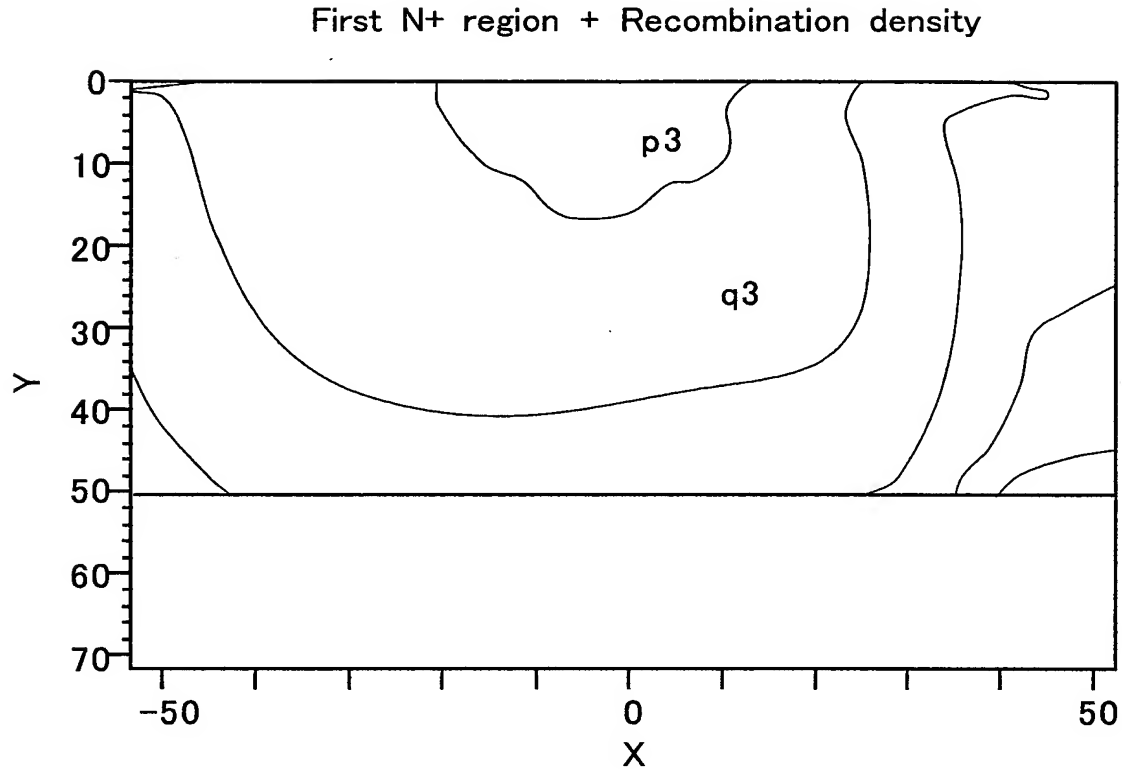


FIG.18

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srhRecombination

	3.79523E+29
	1.5859E+28
p3	6.62696E+26
q3	2.76919E+25
	1.15715E+24
	4.83536E+22
	2.02054E+21
	8.44316E+19
	3.52812E+18
	1.47428E+17
	6.16055E+15
	2.57429E+14
	1.07571E+13
	4.49504E+11
	1.87833E+10
	7.84892E+08
	3.2798E+07
	1.37052E+06
	57269.6
	2393.11

FIG.19A

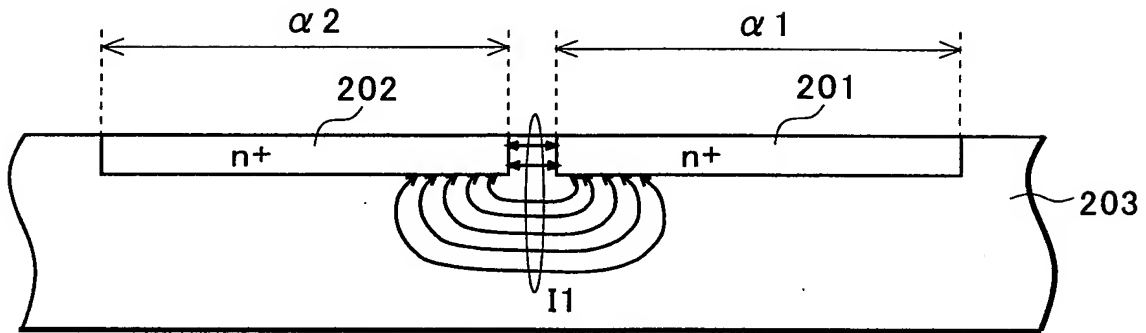


FIG.19B

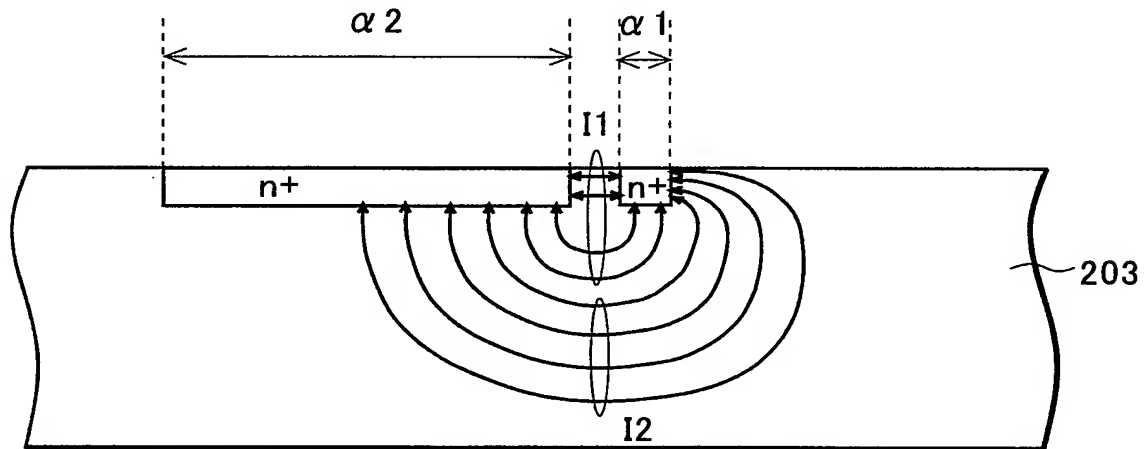
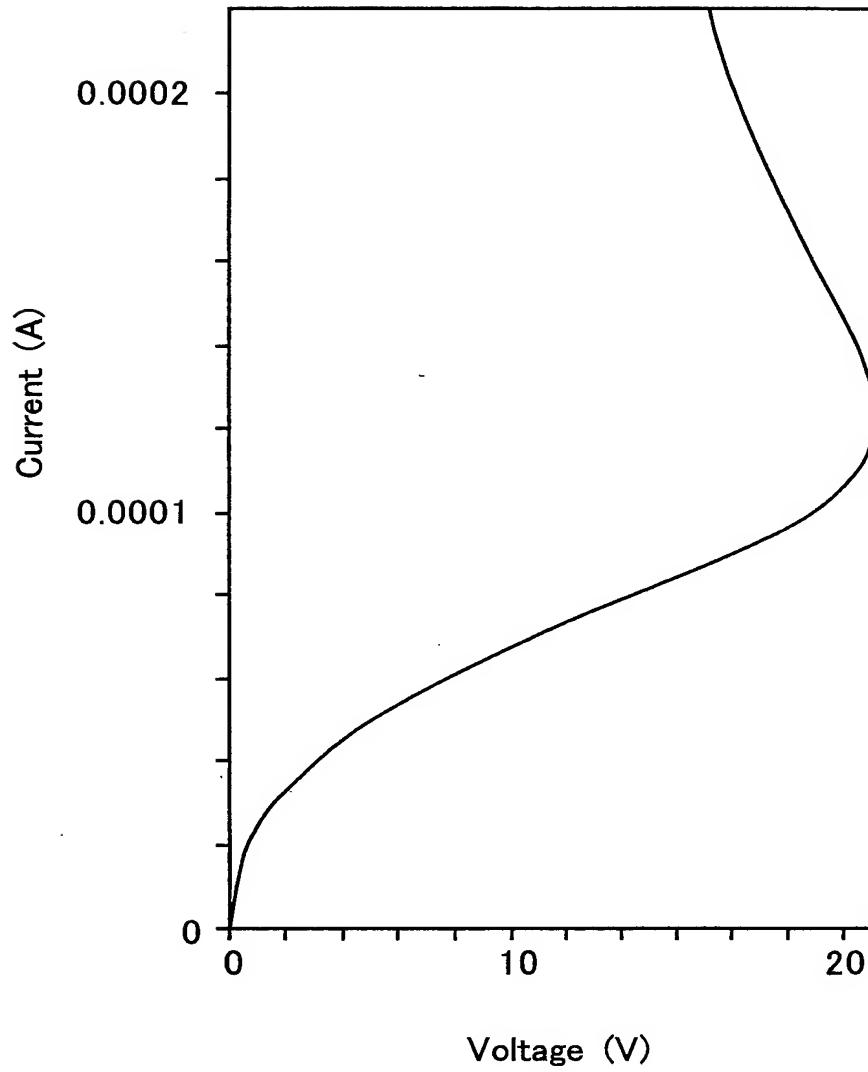


FIG.20



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FIG.21

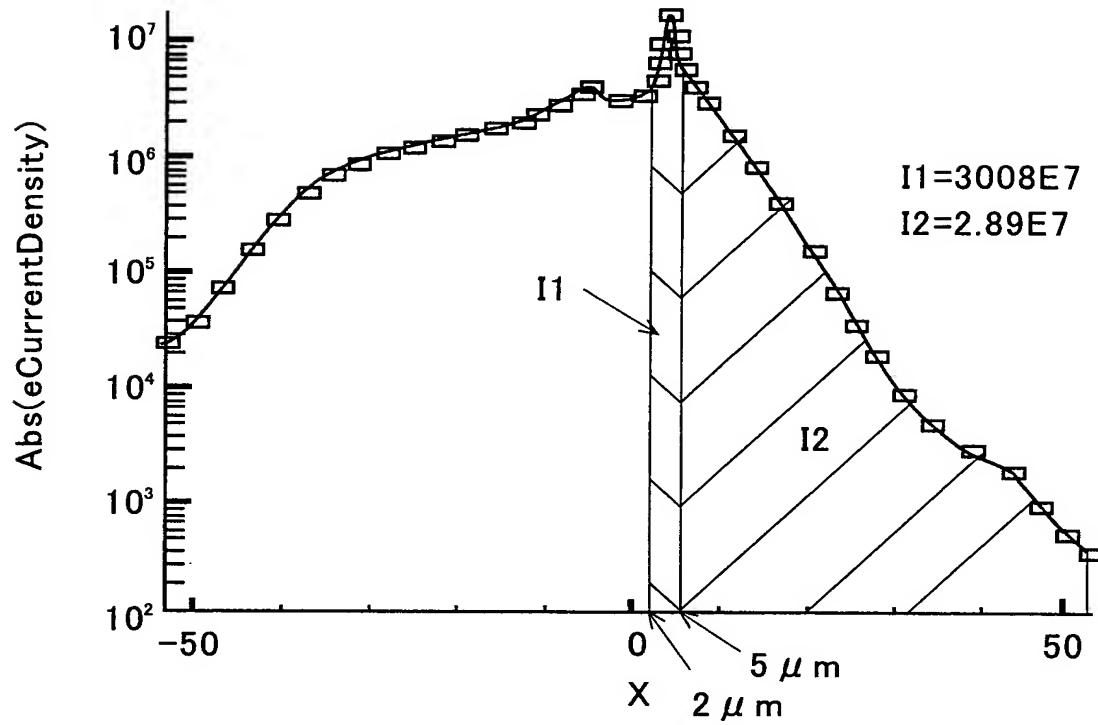


FIG.22A

Comparison of spreading of currents and recombination

	a-structure			b-structure-1			b-structure-2		
Electron current density	y__2	x__0	Product	y__2	x__0	Product	y__2	x__0	Product
	21.9	10.5	230.0	26	15	390.0	23.8	11.3	268.9
Hole current density	y__2	x__0		y__2	x__0		y__2	x__0	
	13.7	6	82.2	23.9	12.5	298.8	12.7	7.4	94.0
Recombination density	y__2	x__0		y__2	x__0		y__2	x__0	
	29.7	14.8	439.6	33.1	20	662.0	33.9	15.5	525.5

FIG.22B

b-structure-3		
y__2	x__0	Product
69	36.1	2490.9
y__2	x__0	
47.9	29.1	1393.9
y__2	x__0	
80 or more	43.9	3512 or more

FIG.22C

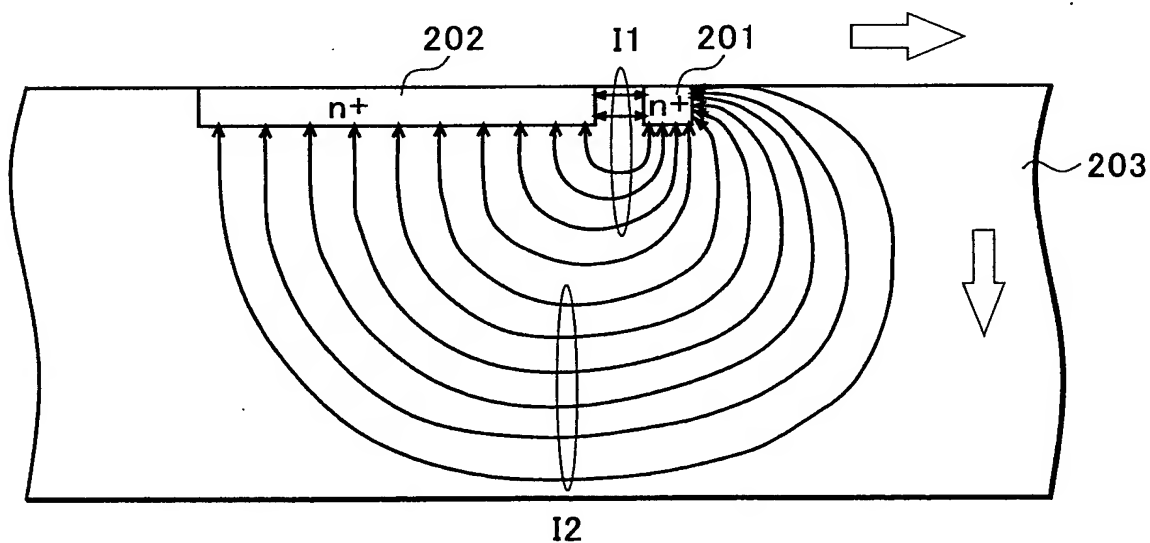
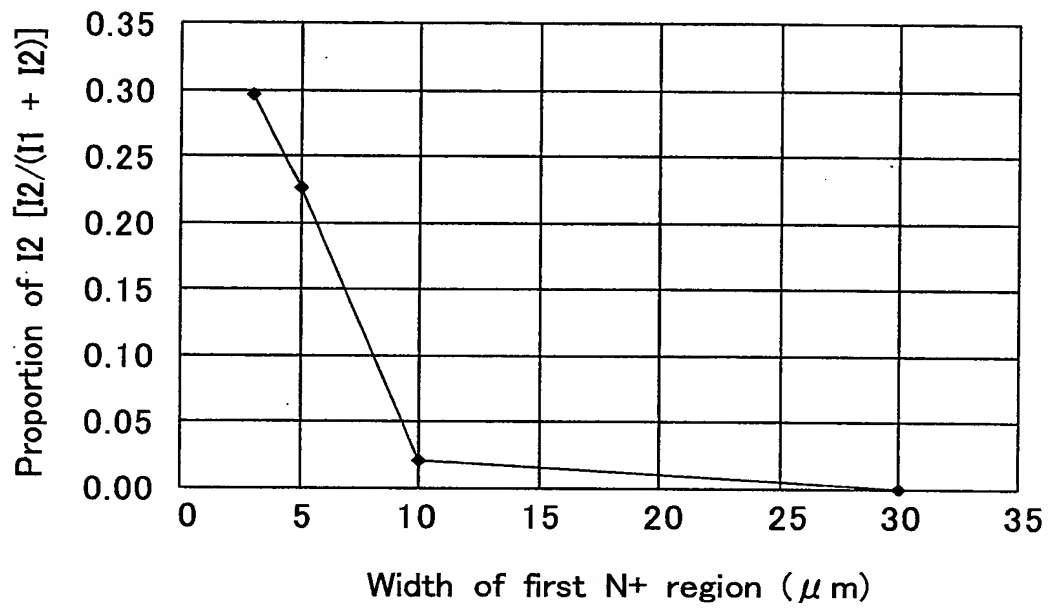


FIG.23

Relationship between the proportion of I2
and the width of the first N+ region



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FIG.24A

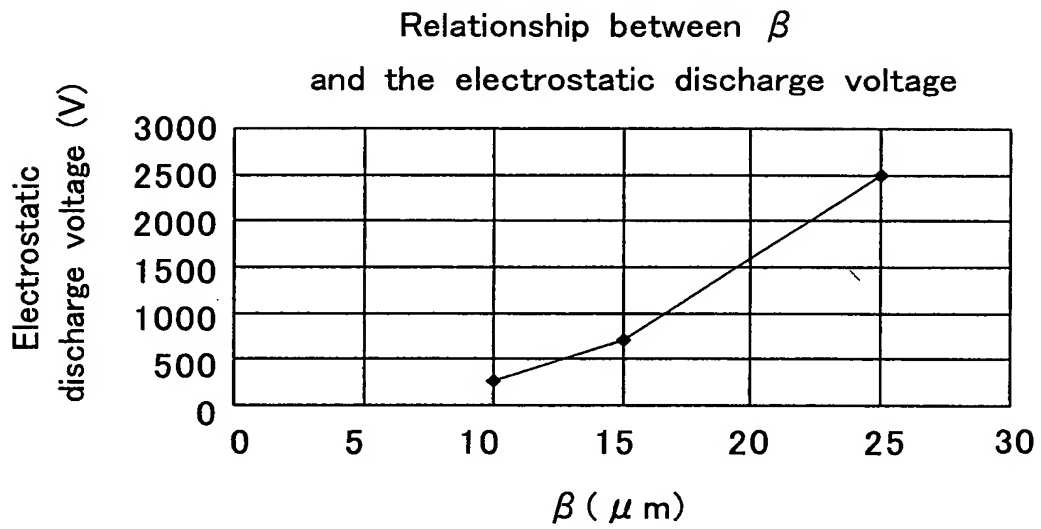
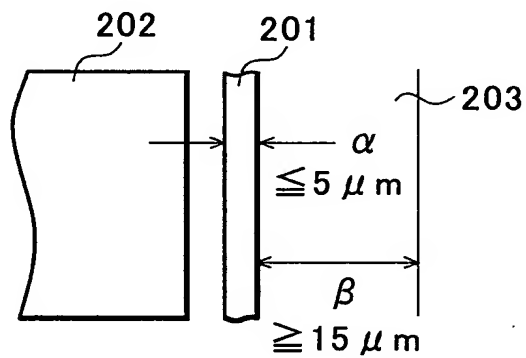


FIG.24B



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FIG.25A

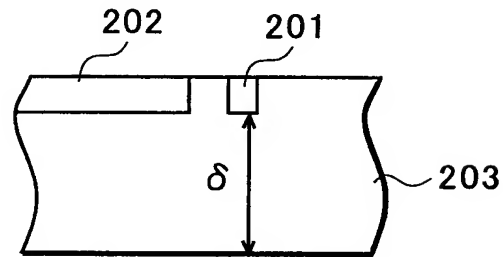


FIG.25B

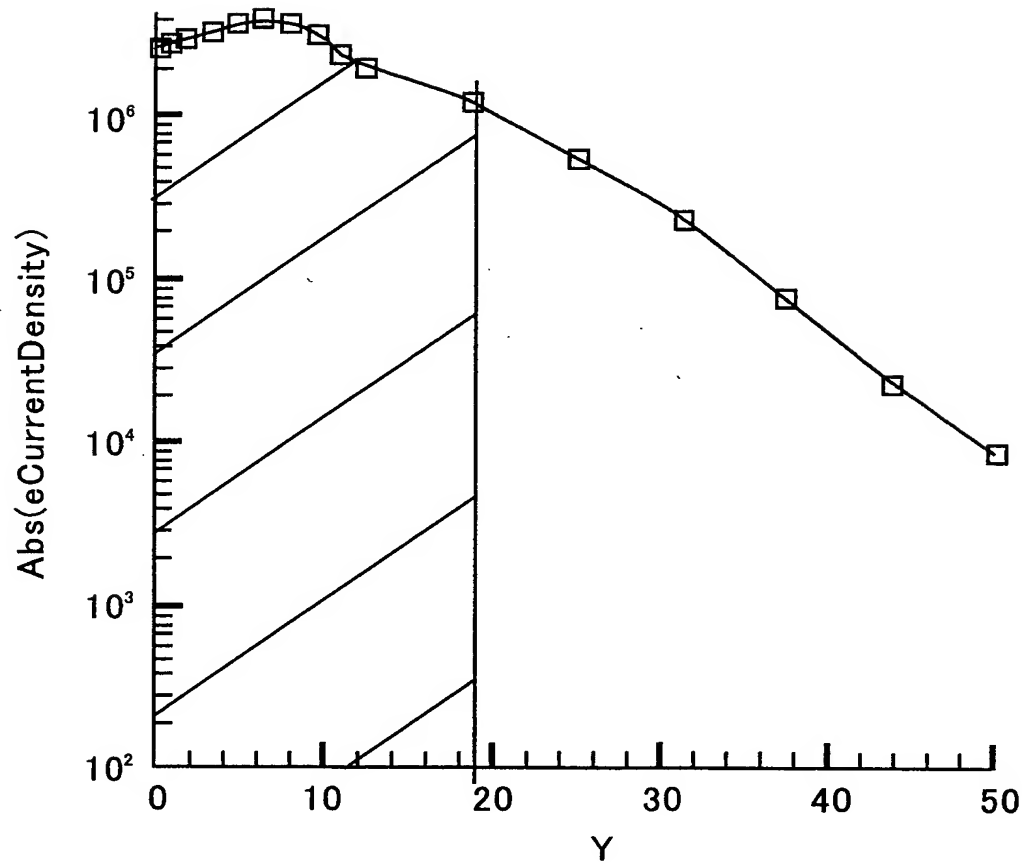


FIG.26A

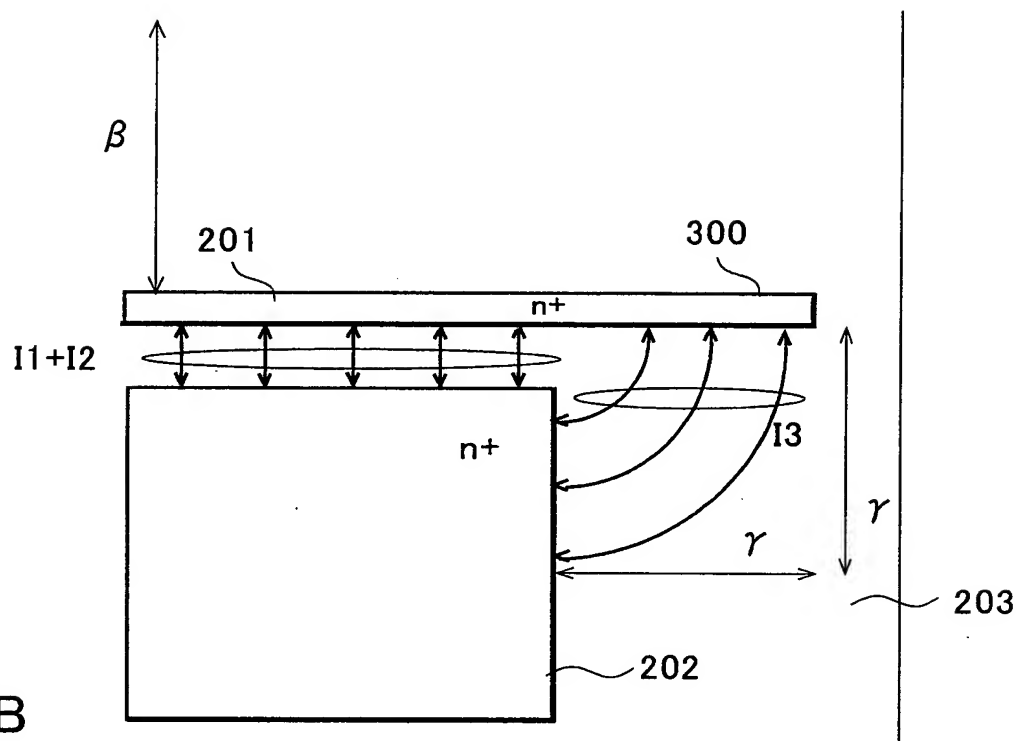
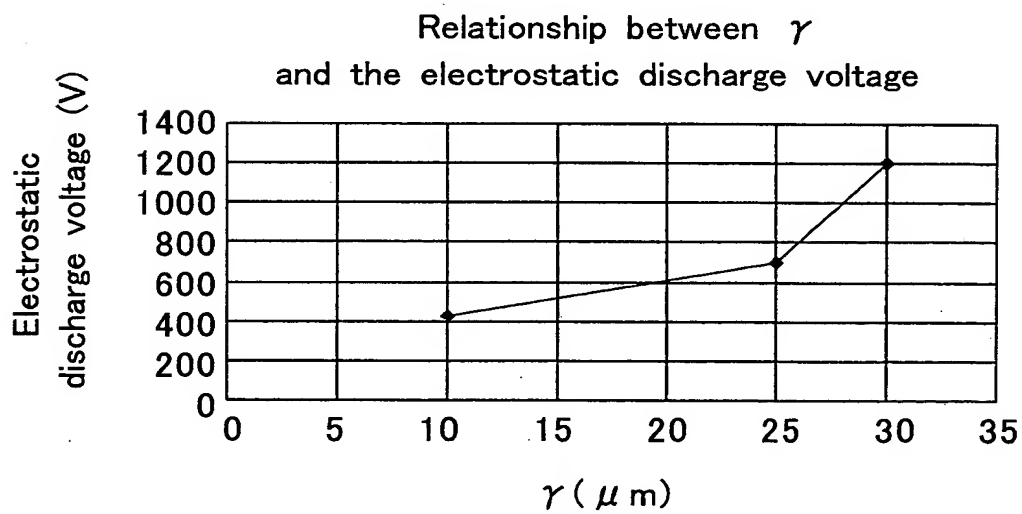


FIG.26B



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FIG.27

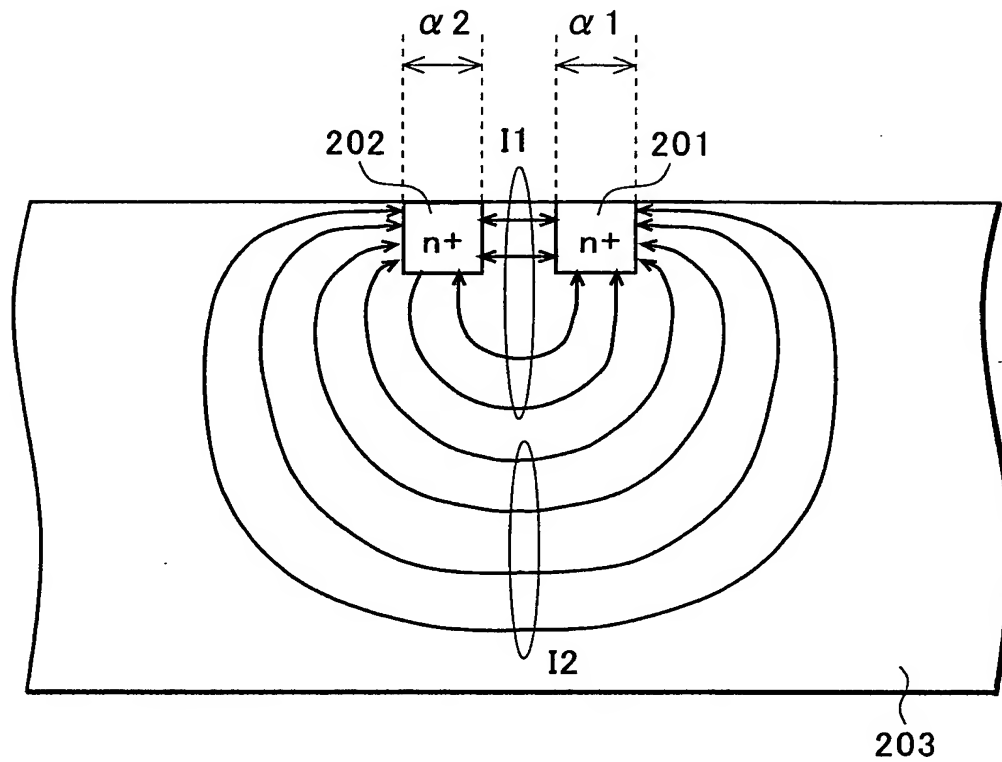


FIG.28

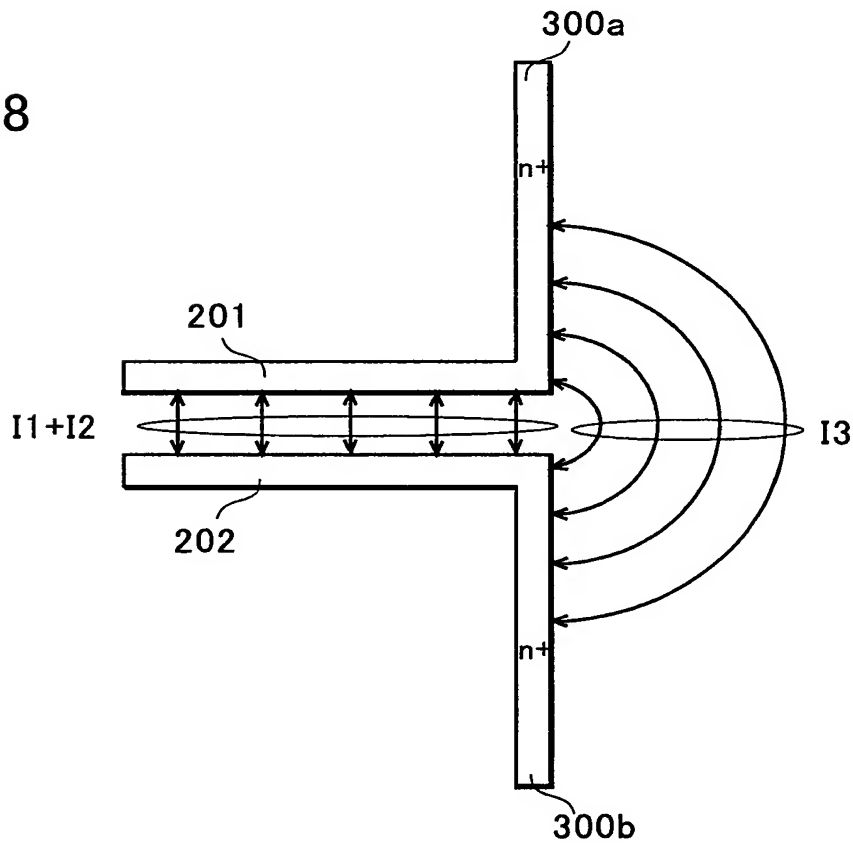
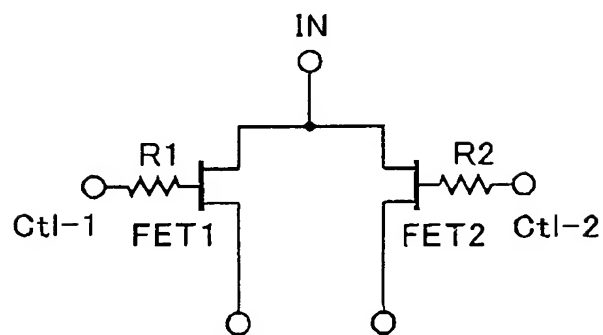
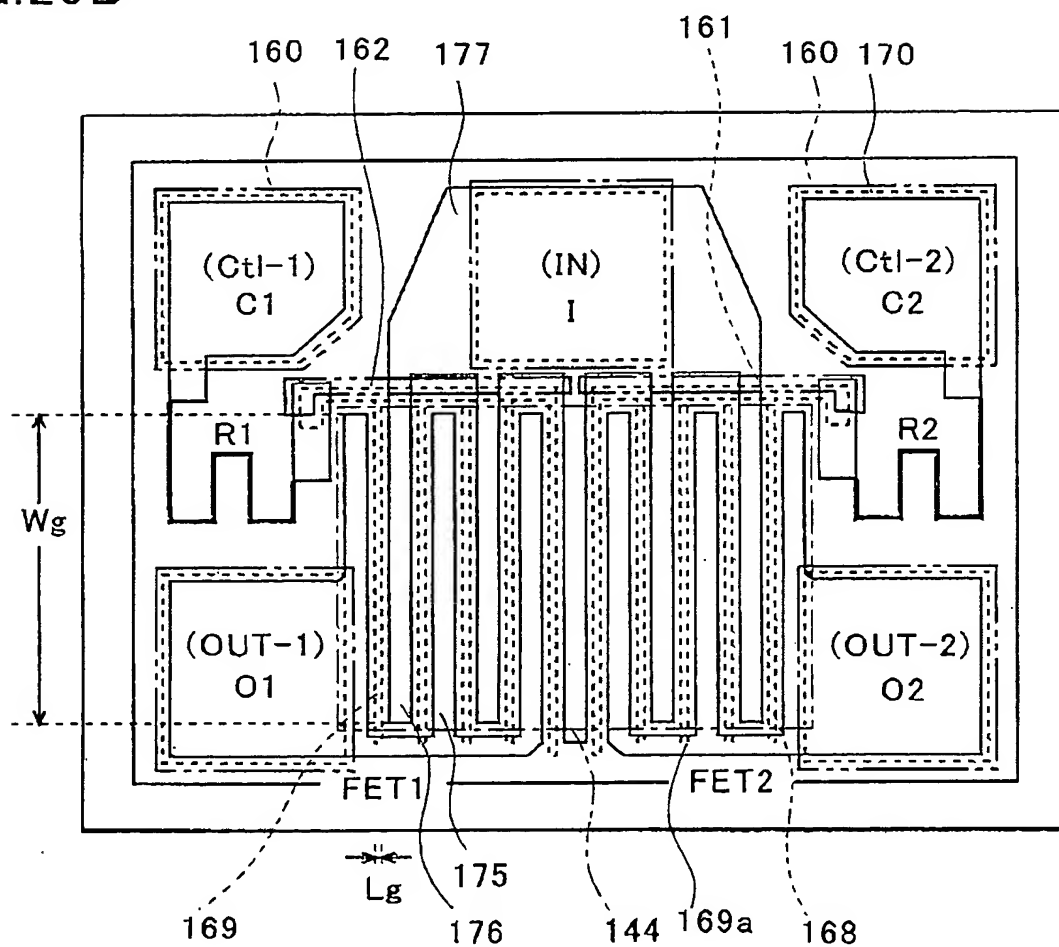


FIG.29A



Prior Art

FIG.29B

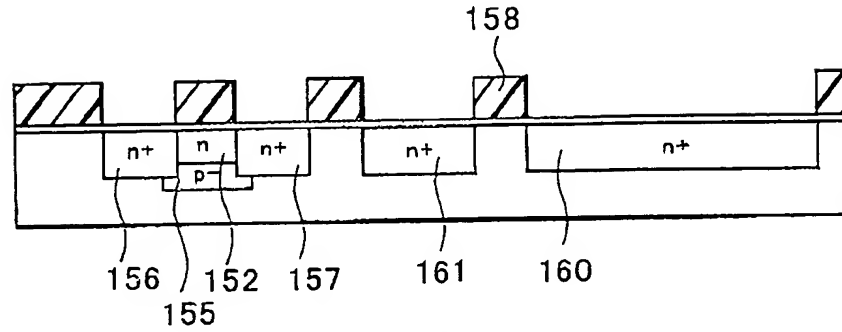


Prior Art

A cross-sectional view of a semiconductor device. The device has a substrate 151. A central region 115 is doped with p-type material (p-). On either side of this central region are regions doped with n-type material (n+). The n+ regions are labeled 156 on the left and 157 on the right. Above the n+ regions are gate structures 175 and 176, which are part of a larger gate stack 165 and 166 respectively. The gate stack includes a gate dielectric 169. The gate structures are connected to terminals S, G, and D. A dashed line 144 indicates the interface between the substrate 151 and the n+ regions. A dashed line 152 indicates the interface between the p- region and the n+ regions. A dashed line 153 indicates the interface between the gate dielectric 169 and the n+ regions. A dashed line 154 indicates the interface between the gate dielectric 169 and the p- region. A dashed line 155 indicates the interface between the gate dielectric 169 and the gate structures 175 and 176.

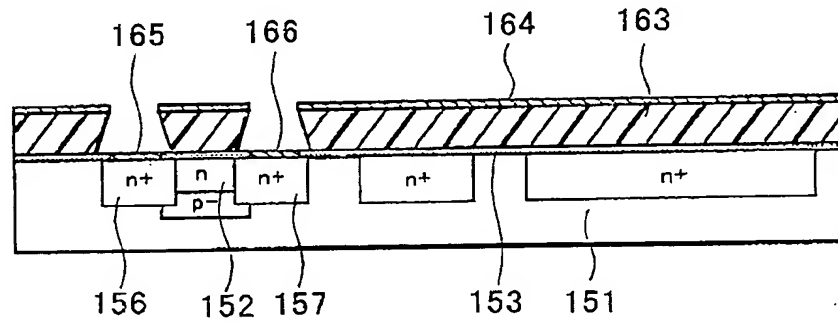
Prior Art

FIG.31A



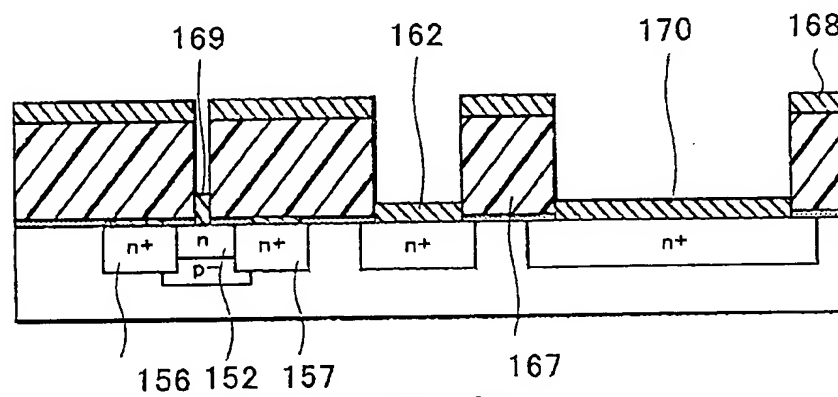
Prior Art

FIG.31B



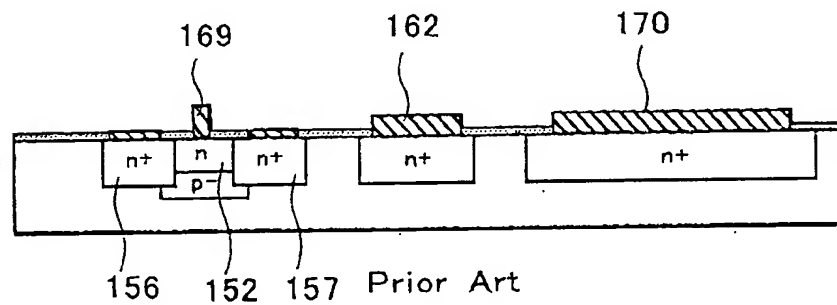
Prior Art

FIG.31C



Prior Art

FIG.31D



Prior Art

FIG.32A

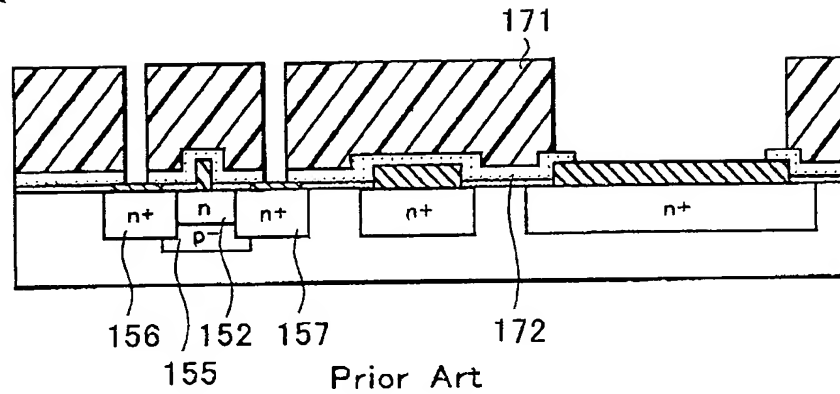


FIG.32B

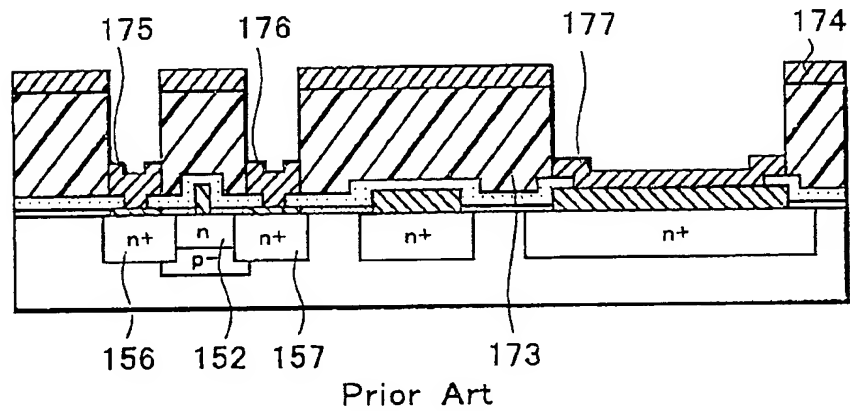


FIG.32C

